(12) INTERNATIONAL APPLICATION PUBLISHED UNDER THE PATENT COOPERATION TREATY (PCT)

(19) World Intellectual Property Organization
International Bureau

(43) International Publication Date
12 April 2007 (12.04.2007)

PCT

(10) International Publication Number
WO 2007/039423 A2

(51) International Patent Classification:
A01N 47/24 (2006.01) *A01P 15/00* (2006.01)

(21) International Application Number:
PCT/EP2006/066337

(22) International Filing Date:
14 September 2006 (14.09.2006)

(25) Filing Language: English

(26) Publication Language: English

(30) Priority Data:
11/230454 21 September 2005 (21.09.2005) US

(71) Applicant *(for all designated States except US)*: **BASF AKTIENGESELLSCHAFT** [DE/DE]; 67056 Ludwigshafen (DE).

(72) Inventors; and

(75) Inventors/Applicants *(for US only)*: **KOEHLE, Harald** [DE/US]; 203 Crescendo Drive, Morrisville, NC 27560 (US). **NIEDENBRÜCK, Matthias** [DE/DE]; Albert-Einstein-Allee 3, 67117 Limburgerhof (DE). **TAVARES-RODRIGUES, Marco-Antonio** [BR/BR]; Lino de Almeida Pires, 282 Apto 51, 04317-180 Jabaquara - Sao Paulo (BR). **SANCHEZ, Waldemar** [—/BR]; Estrada Samuel Aizemberg 1707, Sao Bernardo do Campo (BR). **BEGLIOMINI, Edson** [BR/BR]; Rua Palestina, 200/53/apto 22, Sao Paulo, SP 04362-030 (BR). **OLIVEIRA, Claudio** [/BR]; Estrada Samuel Aizemberg 1707, 09851550 Sao Bernardo do Campo (BR).

(74) Common Representative: **BASF AKTIENGESELLSCHAFT**; 67056 Ludwigshafen (DE).

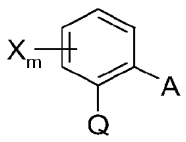
(81) Designated States *(unless otherwise indicated, for every kind of national protection available)*: AE, AG, AL, AM, AT, AU, AZ, BA, BB, BG, BR, BW, BY, BZ, CA, CH, CN, CO, CR, CU, CZ, DE, DK, DM, DZ, EC, EE, EG, ES, FI, GB, GD, GE, GH, GM, HN, HR, HU, ID, IL, IN, IS, JP, KE, KG, KM, KN, KP, KR, KZ, LA, LC, LK, LR, LS, LT, LU, LV, LY, MA, MD, MG, MK, MN, MW, MX, MY, MZ, NA, NG, NI, NO, NZ, OM, PG, PH, PL, PT, RO, RS, RU, SC, SD, SE, SG, SK, SL, SM, SV, SY, TJ, TM, TN, TR, TT, TZ, UA, UG, US, UZ, VC, VN, ZA, ZM, ZW.

(84) Designated States *(unless otherwise indicated, for every kind of regional protection available)*: ARIPO (BW, GH, GM, KE, LS, MW, MZ, NA, SD, SL, SZ, TZ, UG, ZM, ZW), Eurasian (AM, AZ, BY, KG, KZ, MD, RU, TJ, TM), European (AT, BE, BG, CH, CY, CZ, DE, DK, EE, ES, FI, FR, GB, GR, HU, IE, IS, IT, LT, LU, LV, MC, NL, PL, PT, RO, SE, SI, SK, TR), OAPI (BF, BJ, CF, CG, CI, CM, GA, GN, GQ, GW, ML, MR, NE, SN, TD, TG).

Published:
— *without international search report and to be republished upon receipt of that report*

For two-letter codes and other abbreviations, refer to the "Guidance Notes on Codes and Abbreviations" appearing at the beginning of each regular issue of the PCT Gazette.

(54) Title: METHOD OF INDUCING VIRUS TOLERANCE OF PLANTS



(I)

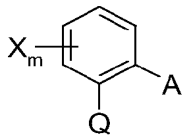
(57) Abstract: A method of inducing virus tolerance of plants which comprises treating the plants, the soil or seeds with an effective amount of a compound of the Formula (I) in which the variables are defined in the description, which is taken up by the plants or seeds, during the first six weeks of the growth period of the plants or germination of the seeds.

WO 2007/039423 A2

Method of inducing virus tolerance of plants

Description

The present invention relates to a method of inducing virus tolerance of plants which comprises treating the plants, the soil or seeds with an effective amount of a compound of the formula I



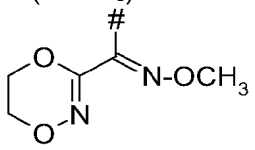
I

in which

X is halogen, C_1-C_4-alkyl or trifluoromethyl;

m is 0 or 1;

Q is $C(=CH-CH_3)-COOCH_3$, $C(=CH-OCH_3)-COOCH_3$, $C(=N-OCH_3)-CONHCH_3$, $C(=N-OCH_3)-COOCH_3$, $N(-OCH_3)-COOCH_3$, or a group Q1



Q1

wherein # denotes the bond to the phenyl ring;

A is -O-B, $-CH_2O$-B, $-OCH_2$-B, $-CH_2S$-B, -CH=CH-B, -C≡C-B, $-CH_2O-N=C(R^1)$-B, $-CH_2S-N=C(R^1)$-B, $-CH_2O-N=C(R^1)-CH=CH$-B, or $-CH_2O-N=C(R^1)-C(R^2)=N-OR^3$, where

B is phenyl, naphthyl, 5–or 6–membered hetaryl or 5–or 6–membered heterocyclyl, containing one to three N atoms and/or one O or S atom or one or two O and/or S atoms, the ring systems being unsubstituted or substituted by one to three radicals R^a:

R^a is cyano, nitro, amino, aminocarbonyl, aminothiocarbonyl, halogen, C_1-C_6-alkyl, C_1-C_6-haloalkyl, C_1-C_6-alkylcarbonyl, C_1-C_6-alkylsulfonyl, C_1-C_6-alkylsulfinyl, C_3-C_6-cycloalkyl, C_1-C_6-alkoxy, C_1-C_6-haloalkoxy, C_1-C_6-alkyloxycarbonyl, C_1-C_6-alkylthio, C_1-C_6-alkylamino, di-C_1-C_6-alkylamino, C_1-C_6-alkylaminocarbonyl, di-C_1-C_6-alkylamino-carbonyl, C_1-C_6-alkylaminothiocarbonyl, di-C_1-C_6-alkylaminothiocarbonyl, C_2-C_6-alkenyl, C_2-C_6-alkenyloxy, phenyl, phenoxy, benzyl, benzyloxy, 5– or 6–membered heterocyclyl, 5– or 6–membered hetaryl, 5– or 6–membered hetaryloxy, $C(=NOR^a)-R^b$ or $OC(R^a)_2-C(R^b)=NOR^b$,

the cyclic radicals, in turn, being unsubstituted or substituted by one to three radicals R^b:

R^b is cyano, nitro, halogen, amino, aminocarbonyl, aminothiocarbonyl, C_1-C_6-alkyl, C_1-C_6-haloalkyl, C_1-C_6-alkylsulfonyl, C_1-C_6-alkylsulfinyl, C_3-C_6-cycloalkyl, C_1-C_6-alkoxy, C_1-C_6-haloalkoxy, C_1-C_6-alkoxycarbonyl, C_1-C_6-alkylthio, C_1-C_6-alkylamino, di-C_1-C_6-alkylamino, C_1-C_6-alkylaminocarbonyl, di-C_1-C_6-alkylamino-carbonyl, C_1-C_6-alkylaminothiocarbonyl, di-C_1-C_6-alkylaminothiocarbonyl, C_2-C_6-alkenyl, C_2-C_6-alkenyloxy, C_3–C_6–cycloalkyl, C_3–C_6–cycloalkenyl, phenyl, phenoxy, phenylthio, benzyl, benzyloxy, 5– or 6–membered heterocyclyl, 5– or 6–membered hetaryl, 5– or 6–membered hetaryloxy or $C(=NOR^A)$-R^B;

R^A, R^B are hydrogen or C_1-C_6-alkyl;

R^1 is hydrogen, cyano, C_1-C_4-alkyl, C_1-C_4-haloalkyl, C_3-C_6-cycloalkyl, C_1-C_4-alkoxy, or C_1-C_4-alkylthio;

R^2 is phenyl, phenylcarbonyl, phenylsulfonyl, 5– or 6–membered hetaryl, 5– or 6–membered hetarylcarbonyl or 5– or 6–membered hetarylsulfonyl, the ring systems being unsubstituted or substituted by one to three radicals R^a,

C_1-C_{10}-alkyl, C_3-C_6-cycloalkyl, C_2-C_{10}-alkenyl, C_2-C_{10}-alkynyl, C_1-C_{10}-alkylcarbonyl, C_2-C_{10}-alkenylcarbonyl, C_3-C_{10}-alkynylcarbonyl, C_1-C_{10}-alkylsulfonyl, or $C(=NOR^A)$-R^B, the hydrocarbon radicals of these groups being unsubstituted or substituted by one to three radicals R^c:

R^c is cyano, nitro, amino, aminocarbonyl, aminothiocarbonyl, halogen, C_1-C_6-alkyl, C_1-C_6-haloalkyl, C_1-C_6-alkylsulfonyl, C_1-C_6-alkylsulfinyl, C_1-C_6-alkoxy, C_1-C_6-haloalkoxy, C_1-C_6-alkoxycarbonyl, C_1-C_6-alkylthio, C_1-C_6-alkylamino, di-C_1-C_6-alkylamino, C_1-C_6-alkylaminocarbonyl, di-C_1-C_6-alkylaminocarbonyl, C_1-C_6-alkylaminothiocarbonyl, di-C_1-C_6-alkylaminothiocarbonyl, C_2-C_6-alkenyl, C_2-C_6-alkenyloxy,

C_3-C_6-cycloalkyl, C_3-C_6-cycloalkyloxy, 5– or 6–membered heterocyclyl, 5– or 6–membered heterocyclyloxy, benzyl, benzyloxy, phenyl, phenoxy, phenylthio, 5– or 6–membered hetaryl, 5– or 6–membered hetaryloxy and hetarylthio, it being possible for the cyclic

groups, in turn, to be partially or fully halogenated or to have attached to them one to three radicals R^a; and

R^3 is hydrogen, C_1-C_6-alkyl, C_2-C_6-alkenyl, C_2-C_6-alkynyl, the hydrocarbon radicals of these groups being unsubstituted or substituted by one to three radicals R^c;

which is taken up by the plants or seeds, during the first six weeks of the growth period of the plants or germination of the seeds.

A large number of representatives of the highly heterogeneous group of plant viruses (phytophages) are capable of attacking economically relevant plants; the symptoms of the damage range from morphological modifications to the death of the plants. The very many ways in which viruses are transmitted (for example mechanically via wounding, via seeds and pollen, or via vectors such as nematodes and insects), the problems of diagnosis and the lack of suitable active ingredients make the control of such viruses extraordinarily difficult; the emphasis is therefore on preventative and phytosanitary measures. Accordingly, preventing viral diseases in plants is an important aim in agriculture.

The search for methods for preventing viral diseases in plants has already yielded antiviral active ingredients, some of which resemble nucleic acids. However, some of these substances generate mutants and inhibit the metabolism of nucleic acids and proteins in the host cells, giving rise to damage. In the field, these materials have only a small actual control effect.

A sophisticated principle is the utilization, or stimulation, of the plants' intrinsic defenses:

DE-A 39 34 761 proposes polylysine and alkyldiethylene-triaminoacetic acids for preventing viral diseases of plants. EP–A 420 803 describes the immunizing effect of benzo-1,2,3-thiazole derivatives against various phytopathogenic microorganisms. WO-A 96/37493 discloses a similar effect of pyridylthiazoles.

DD 280 030 proposes sulfonic acid derivatives as agents for activating the resistance of crop plants and useful plants. However, the action of these substances is unsatisfactory in many cases.

It is an object of the present invention to provide a method which can be used broadly, which does not damage the plants and which brings about effective immunization of the plants against viral diseases.

We have found that this object is achieved by the method defined at the outset. The active ingredients used are known as fungicides and, in some cases, also as insecticides (EP–A 178 826; EP-A 253 213; WO 93/15046; WO 95/18789; WO 95/21153; WO 95/21154; WO 95/24396; WO 96/01256; WO 97/15552; WO 97/27189).

The good compatibility with plants of the active ingredients of the formula I at the concentrations required for controlling plant diseases permits the treatment of aerial plant parts and also the treatment of propagation material and seed, and of the soil.

WO 01/82701 discloses a method for inducing resitance of plants against virus infection by repeated application of strobilurin type active compounds. However, repeated application of fungicides may select resistant populations of the harmful fungi.

In the method according to the invention the active compounds are applied early in the growth period, long before first preventive fungicidal applications are made, and fungal infection pressure arises.

In one embodiment of the method according to the invention, the active ingredients are taken up by the plant through the roots, finally causing overall protection of the plant.

Thus, the protective action after carrying out the method according to the invention is not just found in those plant parts, which have been sprayed directly, but the tolerance to viral diseases of the entire plant is increased.

In a preferred embodiment of the method, the aerial plant parts are treated with a formulation of the active ingredient I.

The publications cited at the outset describe synthesis routes for the preparation of the active ingredients used in the method according to the invention. Many of the active ingredients are commercially available.

Especially preferred for the method according to the invention are active ingredients with the following meanings of the substituents, in each case alone or in combination, the disclosure of the publications cited being hereby incorporated:

Especially preferred for the method according to the invention are, as component 1, the active ingredients of the formulae II to VIII, in which

V is OCH_3 and $NHCH_3$,

Y is CH and N and

T and Z independently of one another are CH and N.

Preferred active ingredients of the formula I in which Q is $N(-OCH_3)-COOCH_3$ are the compounds described in the publications WO 93/15046 and WO 96/01256.

Preferred active ingredients of the formula I in which Q is $C(=CH-OCH_3)-COOCH_3$ are the compounds described in the publications EP-A 178 826 and EP-A 278 595.

Preferred active ingredients of the formula I in which Q is $C(=N-OCH_3)-COOCH_3$ are the compounds described in the publications EP-A 253 213 and EP-A 254 426.

Preferred active ingredients of the formula I in which Q is $C(=N-OCH_3)-CONHCH_3$ are the compounds described in the publications EP-A 398 692, EP-A 477 631 and EP-A 628 540.

Preferred active ingredients of the formula I in which Q is $C(=CH-CH_3)-COOCH_3$ are the compounds described in the publications EP-A 280 185 and EP-A 350 691.

Preferred active ingredients of the formula I in which Q is $-CH_2O-N=C(R^1)-B$ are the compounds described in the publications EP-A 460 575 and EP-A 463 488.

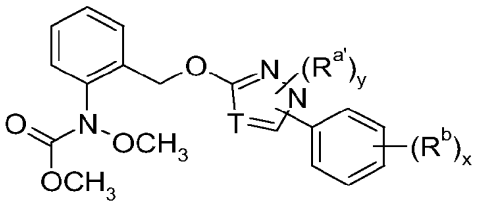
Preferred active ingredients of the formula I in which A is -O-B are the compounds described in the publications EP-A 382 375 and EP-A 398 692.

Preferred active ingredients of the formula I in which A is $-CH_2O-N=C(R^1)-C(R^2)=N-OR^3$ are the compounds described in the publications WO 95/18789, WO 95/21153, WO 95/21154, WO 97/05103 and WO 97/06133.

Especially preferred are the active ingredients of the formula I in which
Q is $N(-OCH_3)-COOCH_3$,
A is CH_2-O- and
B is 3–pyrazolyl or 1,2,4–triazolyl, where B has attached to it one or two substituents selected from the group of

- halogen, methyl and trifluoromethyl and
- phenyl and pyridyl, in particular 2–pyridyl, substituted by 1 to 3 radicals R^b.

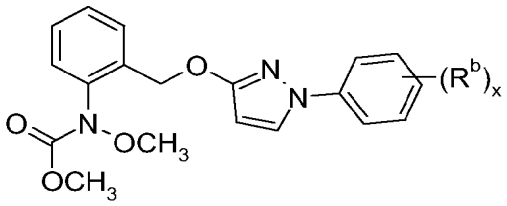
These active ingredients are described by formula II,



II

in which T is a carbon or a nitrogen atom, $R^{a'}$ is halogen, methyl and trifluoromethyl, y is zero, 1 or 2, R^b is as defined for formula I, x is zero, 1, 2, 3 or 4.

More preferred active ingredients are those of formula II':

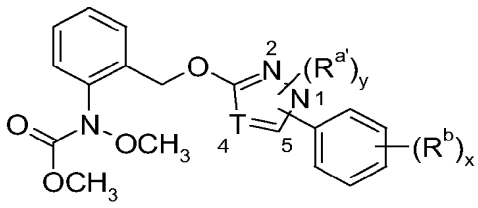


II'

in which R^b is as defined for formula I.

With regard to their use, the compounds compiled in the tables, which follow, are especially preferred.

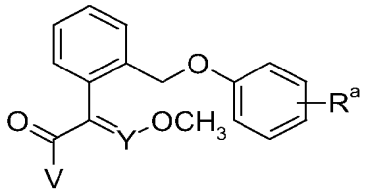
Table I



II

No.	T	$(R^{a'})_y$	Position of the group phenyl-$(R^b)_x$	$(R^b)_x$	Reference
I-1	N	-	1	2,4-Cl_2	WO 96/01256
I-2	N	-	1	4-Cl	WO 96/01256
I-3	CH	-	1	2-Cl	WO 96/01256
I-4	CH	-	1	3-Cl	WO 96/01256
I-5	CH	-	1	4-Cl	WO 96/01256
I-6	CH	-	1	4-CH_3	WO 96/01256
I-7	CH	-	1	H	WO 96/01256
I-8	CH	-	1	3-CH_3	WO 96/01256
I-9	CH	5-CH_3	1	3-CF_3	WO 96/01256
I-10	CH	1-CH_3	5	3-CF_3	WO 99/33812
I-11	CH	1-CH_3	5	4-Cl	WO 99/33812
I-12	CH	1-CH_3	5	-	WO 99/33812

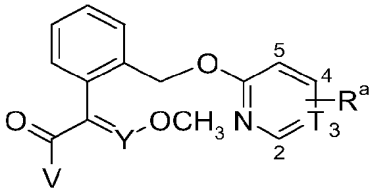
Table II



III

No.	V	Y	R^a	Reference
II-1	OCH_3	N	2-CH_3	EP-A 253 213
II-2	OCH_3	N	2,5-$(CH_3)_2$	EP-A 253 213
II-3	$NHCH_3$	N	2,5-$(CH_3)_2$	EP-A 477 631
II-4	$NHCH_3$	N	2-Cl	EP-A 398 692
II-5	$NHCH_3$	N	2-CH_3	EP-A 398 692
II-6	$NHCH_3$	N	2-CH_3, 4-OCF_3	EP-A 628 540
II-7	$NHCH_3$	N	2-Cl, 4-OCF_3	EP-A 628 540
II-8	$NHCH_3$	N	2-CH_3, 4-$OCH(CH_3)$-$C(CH_3)$=$NOCH_3$	EP-A 11 18 609
II-9	$NHCH_3$	N	2-Cl, 4-$OCH(CH_3)$-$C(CH_3)$=$NOCH_3$	EP-A 11 18 609
II-10	$NHCH_3$	N	2-CH_3, 4-$OCH(CH_3)$-$C(CH_2CH_3)$=$NOCH_3$	EP-A 11 18 609
II-11	OCH_3	CH	2,5-$(CH_3)_2$	EP-A 226 917

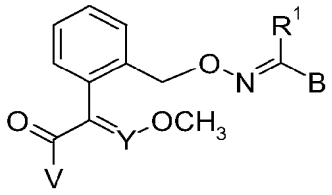
Table III



IV

No.	V	Y	T	R^a	Reference
III-1	OCH_3	CH	N	2-OCH_3, 4-CF_3	WO 96/16047
III-2	OCH_3	CH	N	2-$OCH(CH_3)_2$, 4-CF_3	WO 96/16047
III-3	OCH_3	CH	CH	2-CF_3	EP-A 278 595
III-4	OCH_3	CH	CH	4-CF_3	EP-A 278 595
III-5	$NHCH_3$	N	CH	2-Cl	EP-A 398 692
III-6	$NHCH_3$	N	CH	2-CF_3	EP-A 398 692
III-7	$NHCH_3$	N	CH	2-CF_3, 4-Cl	EP-A 398 692
III-8	$NHCH_3$	N	CH	2-Cl, 4-CF_3	EP-A 398 692

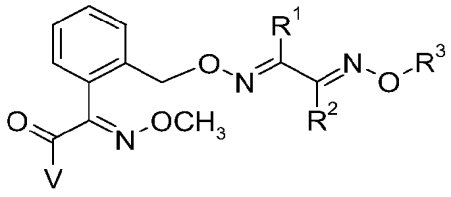
Table IV



V

No.	V	Y	R^1	B	Reference
IV-1	OCH_3	CH	CH_3	$(3\text{-}CF_3)C_6H_4$	EP-A 370 629
IV-2	OCH_3	CH	CH_3	$(3,5\text{-}Cl_2)C_6H_3$	EP-A 370 629
IV-3	$NHCH_3$	N	CH_3	$(3\text{-}CF_3)C_6H_4$	WO 92/13830
IV-4	$NHCH_3$	N	CH_3	$(3\text{-}OCF_3)C_6H_4$	WO 92/13830
IV-5	OCH_3	N	CH_3	$(3\text{-}OCF_3)C_6H_4$	EP-A 460 575
IV-6	OCH_3	N	CH_3	$(3\text{-}CF_3)C_6H_4$	EP-A 460 575
IV-7	OCH_3	N	CH_3	$(3,4\text{-}Cl_2)C_6H_3$	EP-A 460 575
IV-8	OCH_3	N	CH_3	$(3,5\text{-}Cl_2)C_6H_3$	EP-A 463 488
IV-9	OCH_3	CH	CH_3	$CH{=}CH\text{-}(4\text{-}Cl)C_6H_4$	EP-A 936 213

Table V

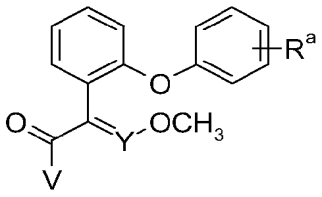


VI

No.	V	R^1	R^2	R^3	Reference
V-1	OCH_3	CH_3	CH_3	CH_3	WO 95/18789
V-2	OCH_3	CH_3	$CH(CH_3)_2$	CH_3	WO 95/18789
V-3	OCH_3	CH_3	CH_2CH_3	CH_3	WO 95/18789
V-4	$NHCH_3$	CH_3	CH_3	CH_3	WO 95/18789
V-5	$NHCH_3$	CH_3	$4\text{-}F\text{-}C_6H_4$	CH_3	WO 95/18789
V-6	$NHCH_3$	CH_3	$4\text{-}Cl\text{-}C_6H_4$	CH_3	WO 95/18789
V-7	$NHCH_3$	CH_3	$2,4\text{-}C_6H_3$	CH_3	WO 95/18789
V-8	$NHCH_3$	Cl	$4\text{-}F\text{-}C_6H_4$	CH_3	WO 98/38857
V-9	$NHCH_3$	Cl	$4\text{-}Cl\text{-}C_6H_4$	CH_2CH_3	WO 98/38857
V-10	$NHCH_3$	CH_3	$CH_2C(=CH_2)CH_3$	CH_3	WO 97/05103
V-11	$NHCH_3$	CH_3	$CH{=}C(CH_3)_2$	CH_3	WO 97/05103
V-12	$NHCH_3$	CH_3	$CH{=}C(CH_3)_2$	CH_2CH_3	WO 97/05103
V-13	$NHCH_3$	CH_3	$CH{=}C(CH_3)CH_2CH_3$	CH_3	WO 97/05103

No.	V	R^1	R^2	R^3	Reference
V-14	$NHCH_3$	CH_3	$O\text{-}CH(CH_3)_2$	CH_3	WO 97/06133
V-15	$NHCH_3$	CH_3	$O\text{-}CH_2CH(CH_3)_2$	CH_3	WO 97/06133
V-16	$NHCH_3$	CH_3	$C(CH_3)=NOCH_3$	CH_3	WO 97/15552

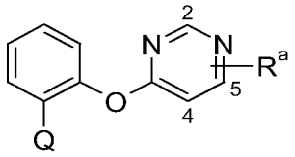
Table VI



VII

No.	V	Y	R^a	Reference
VI-1	$NHCH_3$	N	H	EP-A 398 692
VI-2	$NHCH_3$	N	$3\text{-}CH_3$	EP-A 398 692
VI-3	$NHCH_3$	N	$2\text{-}NO_2$	EP-A 398 692
VI-4	$NHCH_3$	N	$4\text{-}NO_2$	EP-A 398 692
VI-5	$NHCH_3$	N	4-Cl	EP-A 398 692
VI-6	$NHCH_3$	N	4-Br	EP-A 398 692

Table VII



VIII

No.	Q	R^a	Reference
VII-1	$C(=CH\text{-}OCH_3)COOCH_3$	$5\text{-}O\text{-}(2\text{-}CN\text{-}C_6H_4)$	EP-A 382 375
VII-2	$C(=CH\text{-}OCH_3)COOCH_3$	$5\text{-}O\text{-}(2\text{-}Cl\text{-}C_6H_4)$	EP-A 382 375
VII-3	$C(=CH\text{-}OCH_3)COOCH_3$	$5\text{-}O\text{-}(2\text{-}CH_3\text{-}C_6H_4)$	EP-A 382 375
VII-4	$C(=N\text{-}OCH_3)CONHCH_3$	$5\text{-}O\text{-}(2\text{-}Cl\text{-}C_6H_4)$	GB-A 2253624
VII-5	$C(=N\text{-}OCH_3)CONHCH_3$	$5\text{-}O\text{-}(2,4\text{-}Cl_2\text{-}C_6H_3)$	GB-A 2253624
VII-6	$C(=N\text{-}OCH_3)CONHCH_{33}$	$5\text{-}O\text{-}(2\text{-}CH_3\text{-}C_6H_4)$	GB-A 2253624
VII-7	$C(=N\text{-}OCH_3)CONHCH_3$	$5\text{-}O\text{-}(2\text{-}CH_3,3\text{-}Cl\text{-}C_6H_3)$	GB-A 2253624
VII-8	$C(=N\text{-}OCH_3)CONHCH_3$	$4\text{-}F,\ 5\text{-}O\text{-}(2\text{-}CH_3\text{-}C_6H_4)$	WO 98/21189
VII-9	$C(=N\text{-}OCH_3)CONHCH_3$	$4\text{-}F,\ 5\text{-}O\text{-}(2\text{-}Cl\text{-}C_6H_4)$	WO 98/21189
VII-10	$C(=N\text{-}OCH_3)CONHCH_3$	$4\text{-}F,\ 5\text{-}O\text{-}(2\text{-}CH_3,3\text{-}Cl\text{-}C_6H_3)$	WO 98/21189
VII-11	Q1	$4\text{-}F,\ 5\text{-}O\text{-}(2\text{-}Cl\text{-}C_6H_4)$	WO 97/27189
VII-12	Q1	$4\text{-}F,\ 5\text{-}O\text{-}(2\text{-}CH_3,3\text{-}Cl\text{-}C_6H_3)$	WO 97/27189

No.	Q	R^a	Reference
VII-13	Q1	4-F, 5-O-(2,4-Cl_2-C_6H_3)	WO 97/27189

Especially preferred are, in particular, the active ingredients: Compound I-5 (pyraclostrobin), II-1 (kresoxim-methyl), II-3 (dimoxystrobin), II-11 (ZJ 0712), III-3 (picoxystrobin), IV-6 (trifloxystrobin), IV-9 (enestroburin), V-16 (orysastrobin), VI-1 (metominostrobin), VII-1 (azoxystrobin), and VII-11 (fluoxastrobin).

The compounds I increase the tolerance of plants to viruses. They are especially important for controlling viruses on diverse crop plants such as tobacco, barley, cucumber, potatoes and beet, and on the seeds of these plants.

The inventive method is useful to induce tolerance in plants against viruses of various families, such as Avsunviroidae, Bromoviridae, Closteroviridae, Flexiviridae, Geminiviridae, Luteoviridae, Nanoviridae, Partitiviridae, Pospiviroidae, Potyviridae, Reoviridae, Mononegavirales, Rhabdoviridae, Sequiviridae, Tombusviridae, and Tymoviridae.

It is particularly suitable to control the following genus: Benyvirus, Ilarvirus, Cucumovirus, Oleavirus, Tospovirus, Caulimovirus, Soymovirus, Cavemovirus, Petuvirus; Closterovirus; Comovirus; Crinivirus, Ampelovirus, Fabavirus, Nepovirus, Allexivirus, Manadrivirus, Carlavirus, Capillovirus, Foveavirus, Potexvirus, Trichovirus, Vitivirus, Furovirus, Mastrevirus, Curtovirus, Begomovirus, Hordeivirus, Idaeovirus, Luteovirus, Polerovirus, Enamovirus, Nanovirus, Ophiovirus, Ourmiavirus, Alphacryptovirus, Betacryptovirus, Pecluvirus, Pomovirus, Potyvirus, Rymovirus, Bymovirus, Macluravirus, Ipomovirus, Tritimovirus, Fijivirus, Phytoreovirus, Oryzavirus, Cytorhabdovirus, Nucleorhabdovirus, Sequivirus, Waikavirus, Sobemovirus, Tenuivirus, Tobamovirus, Tobravirus, Tombusvirus, Carmovirus, Necrovirus, Dianthovirus, Machlomovirus, Avenavirus, Tymovirus, Marafivirus, Maculavirus, Umbravirus, Varicosavirus, Pospiviroid, Hostuviroid, Cocadviroid, Apscaviroid, Coleviroid, Avsuniviroid, and Pelamoviroid.

More particularly, the inventive method is useful for controlling the following species: Tobacco streak virus, Cucumber mosaic virus, Tomato spotted wilt virus, Soybean chlorotic mottle virus, Broad bean wilt virus 1, Tobacco ringspot virus, Potato virus X, Soil-borne wheat mosaic virus, Barley stripe mosaic virus, Potato leafroll virus, Ourmia melon virus, Peanut clump virus, Potato mop-top virus, Potato virus Y, Barley yellow mosaic virus, Wheat streak mosaic virus, Potato yellow dwarf virus, Tobacco necrosis virus satellite, Southern bean mosaic virus, Tobacco mosaic virus, Tobacco rattle virus, Tomato bushy stunt virus, Tobacco necrosis virus A, Maize chlorotic mottle virus, Maize rayado fino virus, and Potato spindle tuber viroid.

Specifically, they are suitable for controlling the following plant diseases:

- in tobacco, the tobacco mosaic virus and the tobacco necrosis virus,
- in beans, the bean common mosaic virus and the bean yellow mosaic virus,
- in barley, the barley stripe mosaic virus and the barley yellow dwarf virus (DYDV),
- in cucumbers, the cucumber green mottle mosaic virus and the cucumber mosaic virus,
- in potatoes, the potato X virus and the potato γ virus,
- in beet, rhizomania and beet mild yellowing virus.

The application of the compound I preferably is made during the first six weeks, preferably four weeks of the growth period of the plants, long before first protective application against fungi usually is made.

The plant is treated before infection takes place, preferably several weeks to one week before the expected virus attack. During such timeframe one to 10 applications are carried out. A markedly reduced susceptibility of the plant to viral diseases is observed.

In case of vegetables and field crops the active ingredients are preferably applied shortly after germination of the plants, especially within the first four weeks after germination. In case of fruits and other perennial plants the first application is made before begin or within the first four weeks of the growth period. In all cases best efficacy is observed, when the application is repeated every 10 to 20 days.

The method according to the invention is preferably carried out as foliar application when applied to fruit and vegetables, such as potatoes, tomatoes, cucurbits, preferably cucumbers, melons, watermelons, garlic, onions, and lettuce. Preferably more than two applications, and up to 10 applications during a season are carried out.

The method according to the invention is preferably carried out as foliar application when applied to fruits, such as apples, stone fruits, citrus, advocados, papaya and other tropic fruits. Preferably more than two applications, and up to 5 applications during a season are carried out.

The method of the invention can also be applied to field crops, such as soybeans, corn, cotton, tobacco, common beans, wheat, barley, peas, and others. In relation to these crops the method is preferably applied by treating the seeds or the plants. The plants are preferably treated with two to three applications.

For use in crop protection, the application rates are between 0,01 and 2,0 kg, preferably up to 1,0 kg of active ingredient per hectare, depending on the type of pathogen and the plant species.

In the treatment of seed, amounts of from 0,001 to 0,1 g, preferably 0,01 to 0,05 g, of active ingredient are generally required per kilogram of seed.

The compounds I can be converted into the formulations conventionally used for fungicides, for example solutions, emulsions, suspensions, dusts, powders, pastes and granules. The use form depends on the particular purpose; in any case, it should ensure fine and uniform distribution of the compound according to the invention.

Best results are obtained when a formulation is used which supports the transport of the active compounds into the plants, and the distribution within the entire plant in the sap.

The formulations are prepared in a known manner (see e.g. for review US 3,060,084, EP-A 707 445 (for liquid concentrates), Browning, "Agglomeration", Chemical Engineering, Dec. 4, 1967, 147-48, Perry's Chemical Engineer's Handbook, 4th Ed., McGraw-Hill, New York, 1963, pages 8-57 and et seq. WO 91/13546, US 4,172,714, US 4,144,050, US 3,920,442, US 5,180,587, US 5,232,701, US 5,208,030, GB 2,095,558, US 3,299,566, Klingman, Weed Control as a Science, John Wiley and Sons, Inc., New York, 1961, Hance et al., Weed Control Handbook, 8th Ed., Blackwell Scientific Publications, Oxford, 1989 and Mollet, H., Grubemann, A., Formulation technology, Wiley VCH Verlag GmbH, Weinheim (Germany), 2001, 2. D. A. Knowles, Chemistry and Technology of Agrochemical Formulations, Kluwer Academic Publishers, Dordrecht, 1998 (ISBN 0-7514-0443-8), for example by extending the active compound with auxiliaries suitable for the formulation of agrochemicals, such as solvents and/or carriers, if desired emulsifiers, surfactants and dispersants, preservatives, antifoaming agents, anti-freezing agents.

Examples of suitable solvents are water, aromatic solvents (for example Solvesso products, xylene), paraffins (for example mineral oil fractions), alcohols (for example methanol, butanol, pentanol, benzyl alcohol), ketones (for example cyclohexanone, gamma-butyrolactone), pyrrolidones (NMP, NOP), acetates (glycol diacetate), glycols, fatty acid dimethylamides, fatty acids and fatty acid esters. In principle, solvent mixtures may also be used.

Suitable emulsifiers are nonionic and anionic emulsifiers (for example polyoxyethylene fatty alcohol ethers, alkylsulfonates and arylsulfonates).

Examples of dispersants are lignin-sulfite waste liquors and methylcellulose.

Suitable surfactants used are alkali metal, alkaline earth metal and ammonium salts of lignosulfonic acid, naphthalenesulfonic acid, phenolsulfonic acid, dibutylnaphthalenesulfonic acid, alkylarylsulfonates, alkyl sulfates, alkylsulfonates, fatty alcohol sulfates, fatty acids and sulfated fatty alcohol glycol ethers, furthermore condensates of sulfonated naphthalene and naphthalene derivatives with formaldehyde, condensates of naphthalene or of naphthalenesulfonic acid with phenol and formaldehyde, polyoxyethylene octylphenol ether, ethoxylated isooctylphenol, octylphenol, nonylphenol, alkylphenol polyglycol ethers, tributylphenyl polyglycol ether, tristearylphenyl polyglycol ether, alkylaryl polyether alcohols, alcohol and fatty alcohol ethylene oxide condensates, ethoxylated castor oil, polyoxyethylene alkyl ethers, ethoxylated polyoxypropylene, lauryl alcohol polyglycol ether acetal, sorbitol esters, lignosulfite waste liquors and methylcellulose.

Substances which are suitable for the preparation of directly sprayable solutions, emulsions, pastes or oil dispersions are mineral oil fractions of medium to high boiling point, such as kerosene or diesel oil, furthermore coal tar oils and oils of vegetable or animal origin, aliphatic, cyclic and aromatic hydrocarbons, for example toluene, xylene, paraffin, tetrahydronaphthalene, alkylated naphthalenes or their derivatives, methanol, ethanol, propanol, butanol, cyclohexanol, cyclohexanone, isophorone, highly polar solvents, for example dimethyl sulfoxide, N-methylpyrrolidone or water.

Also anti-freezing agents such as glycerin, ethylene glycol, propylene glycol and bactericides such as can be added to the formulation.

Suitable antifoaming agents are for example antifoaming agents based on silicon or magnesium stearate.

Suitable preservatives are for example Dichlorophen und enzylalkoholhemiformal.

Seed Treatment formulations may additionally comprise binders and optionally colorants.

Binders can be added to improve the adhesion of the active materials on the seeds after treatment. Suitable binders are block copolymers EO/PO surfactants but also polyvinylalcoholsl, polyvinylpyrrolidones, polyacrylates, polymethacrylates, polybutenes, polyisobutylenes, polystyrene, polyethyleneamines, polyethyleneamides, polyethyleneimines (Lupasol®, Polymin®), polyethers, polyurethans, polyvinylacetate, tylose and copolymers derived from these polymers.

Powders, materials for spreading and dustable products can be prepared by mixing or concomitantly grinding the active substances with a solid carrier.

Granules, for example coated granules, impregnated granules and homogeneous granules, can be prepared by binding the active compounds to solid carriers.

Examples of solid carriers are mineral earths such as silica gels, silicates, talc, kaolin, attaclay, limestone, lime, chalk, bole, loess, clay, dolomite, diatomaceous earth, calcium sulfate, magnesium sulfate, magnesium oxide, ground synthetic materials, fertilizers, such as, for example, ammonium sulfate, ammonium phosphate, ammonium nitrate, ureas, and products of vegetable origin, such as cereal meal, tree bark meal, wood meal and nutshell meal, cellulose powders and other solid carriers.

In general, the formulations comprise from 0,01 to 95% by weight, preferably from 0,1 to 90% by weight, of the active compound(s). In this case, the active compound(s) are employed in a purity of from 90% to 100% by weight, preferably 95% to 100% by weight(according to NMR spectrum).

For seed treatment purposes, respective formulations can be diluted 2-10 fold leading to concentrations in the ready to use preparations of 0,01 to 60% by weight active compound by weight, preferably 0,1 to 40% by weight.

The compounds I can be used as such, in the form of their formulations or the use forms prepared therefrom, for example in the form of directly sprayable solutions, powders, suspensions or dispersions, emulsions, oil dispersions, pastes, dustable products, materials for spreading, or granules, by means of spraying, atomizing, dusting, spreading or pouring. The use forms depend entirely on the intended purposes; they are intended to ensure in each case the finest possible distribution of the active compound(s) according to the invention.

Aqueous use forms can be prepared from emulsion concentrates, pastes or wettable powders (sprayable powders, oil dispersions) by adding water. To prepare emulsions, pastes or oil dispersions, the substances, as such or dissolved in an oil or solvent, can be homogenized in water by means of a wetter, tackifier, dispersant or emulsifier. However, it is also possible to prepare concentrates composed of active substance, wetter, tackifier, dispersant or emulsifier and, if appropriate, solvent or oil, and such concentrates are suitable for dilution with water.

The active compound concentrations in the ready-to-use preparations can be varied within relatively wide ranges. In general, they are from 0,0001 to 10%, preferably from 0,01 to 1% per weight.

The active compound may also be used successfully in the ultra-low-volume process (ULV), it being possible to apply formulations comprising over 95% by weight of active compound, or even to apply the active compound without additives.

The following are examples of formulations: 1. Products for dilution with water for foliar applications. For seed treatment purposes, such products may be applied to the seed diluted or undiluted.

A) Water-soluble concentrates (SL, LS)
10 parts by weight of the active compound(s) are dissolved in 90 parts by weight of water or a water-soluble solvent. As an alternative, wetters or other auxiliaries are added. The active compound(s) dissolves upon dilution with water, whereby a formulation with 10 % (w/w) of active compound(s) is obtained.

B) Dispersible concentrates (DC)
20 parts by weight of the active compound(s) are dissolved in 70 parts by weight of cyclohexanone with addition of 10 parts by weight of a dispersant, for example polyvinylpyrrolidone. Dilution with water gives a dispersion, whereby a formulation with 20% (w/w) of active compound(s) is obtained.

C) Emulsifiable concentrates (EC)
15 parts by weight of the active compound(s) are dissolved in 7 parts by weight of xylene with addition of calcium dodecylbenzenesulfonate and castor oil ethoxylate (in each case 5 parts by weight). Dilution with water gives an emulsion, whereby a formulation with 15% (w/w) of active compound(s) is obtained.

D) Emulsions (EW, EO, ES)
25 parts by weight of the active compound(s) are dissolved in 35 parts by weight of xylene with addition of calcium dodecylbenzenesulfonate and castor oil ethoxylate (in each case 5 parts by weight). This mixture is introduced into 30 parts by weight of water by means of an emulsifier machine (e.g. Ultraturrax) and made into a homogeneous emulsion. Dilution with water gives an emulsion, whereby a formulation with 25% (w/w) of active compound(s) is obtained.

E) Suspensions (SC, OD, FS)
In an agitated ball mill, 20 parts by weight of the active compound(s) are comminuted with addition of 10 parts by weight of dispersants, wetters and 70 parts by weight of water or of an organic solvent to give a fine active compound(s) suspension. Dilution with water gives a stable suspension of the active compound(s), whereby a formulation with 20% (w/w) of active compound(s) is obtained.

F) Water-dispersible granules and water-soluble granules (WG, SG)
50 parts by weight of the active compound(s) are ground finely with addition of 50 parts by weight of dispersants and wetters and made as water-dispersible or water-soluble granules by means of technical appliances (for example extrusion, spray tower, fluidized bed). Dilution with water gives a stable dispersion or solution of the active compound(s), whereby a formulation with 50% (w/w) of active compound(s) is obtained.

G) Water-dispersible powders and water-soluble powders (WP, SP, SS, WS)
75 parts by weight of the active compound(s) are ground in a rotor-stator mill with addition of 25 parts by weight of dispersants, wetters and silica gel. Dilution with water gives a stable dispersion or solution of the active compound(s) , whereby a formulation with 75% (w/w) of active compound(s) is obtained.

2. Products to be applied undiluted for foliar applications. For seed treatment purposes, such products may be applied to the seed diluted

I) Dustable powders (DP, DS)
5 parts by weight of the active compound(s) are ground finely and mixed intimately with 95 parts by weight of finely divided kaolin. This gives a dustable product having 5% (w/w) of active compound(s)

J) Granules (GR, FG, GG, MG)
0.5 part by weight of the active compound(s) is ground finely and associated with 95.5 parts by weight of carriers, whereby a formulation with 0.5% (w/w) of active compound(s) is obtained. Current methods are extrusion, spray-drying or the fluidized bed. This gives granules to be applied undiluted for foliar use.

K) ULV solutions (UL)
10 parts by weight of the active compound(s) are dissolved in 90 parts by weight of an organic solvent, for example xylene. This gives a product having 10% (w/w) of active compound(s), which is applied undiluted for foliar use.

Conventional seed treatment formulations include for example flowable concentrates FS, solutions LS, powders for dry treatment DS, water dispersible powders for slurry treatment WS, water-soluble powders SS and emulsion ES and EC and gel formulation GF. These formulation can be applied to the seed diluted or undiluted. Application to the seeds is carried out before sowing, either directly on the seeds.

In a preferred embodiment a FS formulation is used for seed treatment. Typcially, a FS formulation may comprise 1-800 g/l of active ingredient, 1-200 g/l Surfactant, 0 to 200 g/l antifreezing agent, 0 to 400 g/l of binder, 0 to 200 g/l of a pigment and up to 1 liter of a solvent, preferably water.

The note mentioning the effect of the active ingredients I in inducing resistance to viruses may be present as a label on the packaging or in product data sheets. The note may also be present in the case of preparations which can be used in combination with the active ingredients I.

The induction of resistance may also constitute an indication which may be the subject of official approval of the active ingredients I.

The action of the compounds of the general formula I was demonstrated by the following experiments:

Use examples for induction of resistance to viruses

Enhanced plant growth and tolerance to viral infection following treatments

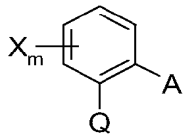
The experiments were performed in greenhouse of under appropriate growing conditions for tomatoes. Tomato plants (cultivar Gaucho) were grown in pots until development of the first two true leaves. Then the plantlets were sprayed with formulated Pyraclostrobin (compound I-5; commercial fungicide Cabrio Top® of BASF Aktiengesellschaft). These treatments were done either 120 hours before or following inoculation of the plantlets with TMV, representing protective and curative situation. The treatments were run with 5 replicates, each containing 3 plantlets. 30 days after last treatment the plants were analyzed for visual plant growth (height and dry mass) and chlorophyll content (photometric measurement of extracts).

No.	Treatment	Chlorophyll [µg fresh weight]	Dry weight [g]	Height [cm]
1	Non infected control	12,5 bc	1,54 a	25,59 a
2	TMV infected, untreated	10,8 bc	0,30 ef	9,53 f
3	Cabrio Top 1,5 g/L^{-1} Preventive	18,6 a	0,74 b	18,38 bc
4	Cabrio Top 1,5 g/L^{1} Curative	11,5 bc	0,35 ef	12,48 def

Same letters indicate non significant differences (Tukey; $P \leq 0,05$).

Claims:

1. A method of inducing virus tolerance of plants which comprises treating the plants, the soil or seeds, with an effective amount of a compound of formula I



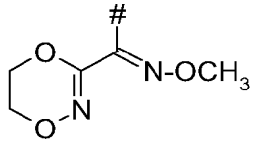
I

in which

X is halogen, C_1-C_4-alkyl or trifluoromethyl;

m is 0 or 1;

Q is $C(=CH-CH_3)-COOCH_3$, $C(=CH-OCH_3)-COOCH_3$, $C(=N-OCH_3)-CONHCH_3$, $C(=N-OCH_3)-COOCH_3$, $N(-OCH_3)-COOCH_3$, or a group Q1



Q1

wherein # denotes the bond to the phenyl ring;

A is -O-B, $-CH_2O$-B, $-OCH_2$-B, $-CH_2S$-B, -CH=CH-B, -C≡C-B, $-CH_2O-N=C(R^1)$-B, $-CH_2S-N=C(R^1)$-B, $-CH_2O-N=C(R^1)-CH=CH$-B, or $-CH_2O-N=C(R^1)-C(R^2)=N-OR^3$, where

B is phenyl, naphthyl, 5–membered or 6–membered hetaryl or 5–membered or 6–membered heterocyclyl, containing one to three N atoms and/or one O or S atom or one or two O and/or S atoms, the ring systems being unsubstituted or substituted by one to three radicals R^a:

R^a is cyano, nitro, amino, aminocarbonyl, aminothiocarbonyl, halogen, C_1-C_6-alkyl, C_1-C_6-haloalkyl, C_1-C_6-alkylcarbonyl, C_1-C_6-alkylsulfonyl, C_1-C_6-alkylsulfinyl, C_3-C_6-cycloalkyl, C_1-C_6-alkoxy, C_1-C_6-haloalkoxy, C_1-C_6-alkyloxycarbonyl, C_1-C_6-alkylthio, C_1-C_6-alkylamino, di-C_1-C_6-alkylamino, C_1-C_6-alkylaminocarbonyl, di-C_1-C_6-alkylaminocarbonyl, C_1-C_6-alkylaminothiocarbonyl, di-C_1-C_6-alkylaminothiocarbonyl, C_2-C_6-alkenyl, C_2-C_6-alkenyloxy, phenyl, phenoxy, benzyl, benzyloxy, 5– or 6–membered heterocyclyl, 5– or 6–membered hetaryl, 5– or 6–membered hetaryloxy, $C(=NOR^a)-R^b$ or $OC(R^a)_2-C(R^b)=NOR^b$,

the cyclic radicals, in turn, being unsubstituted or substituted by one to three radicals R^b:

R^b is cyano, nitro, halogen, amino, aminocarbonyl, aminothiocarbonyl, C_1-C_6-alkyl, C_1-C_6-haloalkyl, C_1-C_6-alkylsulfonyl, C_1-C_6-alkylsulfinyl, C_3-C_6-cycloalkyl, C_1-C_6-alkoxy, C_1-C_6-haloalkoxy, C_1-C_6-alkoxy-carbonyl, C_1-C_6-alkylthio, C_1-C_6-alkylamino, di-C_1-C_6-alkylamino, C_1-C_6-alkylaminocarbonyl, di-C_1-C_6-alkylaminocarbonyl, C_1-C_6-alkylaminothiocarbonyl, di-C_1-C_6-alkyl-aminothiocarbonyl, C_2-C_6-alkenyl, C_2-C_6-alkenyloxy, C_3–C_6–cycloalkyl, C_3–C_6–cycloalkenyl, phenyl, phenoxy, phenylthio, benzyl, benzyloxy, 5– or 6–membered heterocyclyl, 5– or 6–membered hetaryl, 5– or 6–membered hetaryl-oxy or C(=NOR^A)-R^B;

R^A, R^B are hydrogen or C_1-C_6-alkyl;

R^1 is hydrogen, cyano, C_1-C_4-alkyl, C_1-C_4-haloalkyl, C_3-C_6-cycloalkyl, C_1-C_4-alkoxy, or C_1-C_4-alkylthio;

R^2 is phenyl, phenylcarbonyl, phenylsulfonyl, 5– or 6–membered hetaryl, 5– or 6–membered hetarylcarbonyl or 5– or 6–membered hetaryl-sulfonyl, the ring systems being unsubstituted or substituted by one to three radicals R^a,

C_1-C_{10}-alkyl, C_3-C_6-cycloalkyl, C_2-C_{10}-alkenyl, C_2-C_{10}-alkynyl, C_1-C_{10}-alkylcarbonyl, C_2-C_{10}-alkenylcarbonyl, C_3-C_{10}-alkynylcarbonyl, C_1-C_{10}-alkylsulfonyl, or C(=NOR^a)-R^b, the hydrocarbon radicals of these groups being unsubstituted or substituted by one to three radicals R^c:

R^c is cyano, nitro, amino, aminocarbonyl, aminothiocarbonyl, halogen, C_1-C_6-alkyl, C_1-C_6-haloalkyl, C_1-C_6-alkylsulfonyl, C_1-C_6-alkylsulfinyl, C_1-C_6-alkoxy, C_1-C_6-haloalkoxy, C_1-C_6-alkoxy-carbonyl, C_1-C_6-alkylthio, C_1-C_6-alkylamino, di-C_1-C_6-alkyl-amino, C_1-C_6-alkylaminocarbonyl, di-C_1-C_6-alkylaminocarbonyl, C_1-C_6-alkylaminothiocarbonyl, di-C_1-C_6-alkylaminothiocarbonyl, C_2-C_6-alkenyl, C_2-C_6-alkenyloxy,

C_3-C_6-cycloalkyl, C_3-C_6-cycloalkyloxy, 5– or 6–membered heterocyclyl, 5– or 6–membered heterocyclyloxy, benzyl, benzyl-oxy, phenyl, phenoxy, phenylthio, 5– or 6–membered hetaryl, 5– or 6–membered hetaryloxy and hetarylthio, it being possible for

the cyclic groups, in turn, to be partially or fully halogenated or to have attached to them one to three radicals R^a; and

R^3 is hydrogen, C_1-C_6-alkyl, C_2-C_6-alkenyl, C_2-C_6-alkynyl, the hydrocarbon radicals of these groups being unsubstituted or substituted by one to three radicals R^c;

which is taken up by the plants or seeds, during the first six weeks of the growth period of the plants, or germination of the seeds.

2. A method as claimed in claim 1, wherein in formula I the index m is zero and the substituents have the following meanings:

Q is $C(=CH-CH_3)-COOCH_3$, $C(=CH-OCH_3)-COOCH_3$, $C(=N-OCH_3)-CONHCH_3$, $C(=N-OCH_3)-COOCH_3$, or $N(-OCH_3)-COOCH_3$;

A is -O-B, $-CH_2O$-B, $-OCH_2$-B, $-CH_2O-N=C(R^1)$-B, or $-CH_2O-N=C(R^1)-C(R^2)=N-OR^3$, where

B is phenyl, pyridyl, pyrimidyl, pyrazolyl, triazolyl, these ring systems being unsubstituted or substituted by one to three radicals R^a;

R^1 is hydrogen, cyano, C_1-C_4-alkyl, C_1-C_4-haloalkyl, C_3-C_6-cycloalkyl, or C_1-C_4-alkoxy;

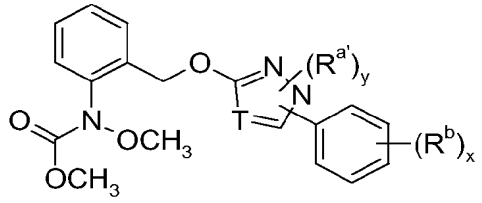
R^2 is C_1-C_6-alkyl, C_2-C_{10}-alkenyl, C_3-C_6-cycloalkyl, these groups being unsubstituted or substituted by one or two radicals $R^{b'}$:

$R^{b'}$ is C_1-C_6-alkyl, C_3-C_6-cycloalkyl, C_1-C_6-alkoxy, C_1-C_6-haloalkoxy, benzyl, phenyl, or phenoxy;

phenyl, which is unsubstituted or substituted by one or two radicals R^a; and

R^3 is C_1-C_6-alkyl, C_2-C_6-alkenyl, or C_2-C_6-alkynyl.

3. A method as claimed in claim 1, wherein an active ingredient of formula II



II

in which

T is a carbon or a nitrogen atom,

$R^{a'}$ is halogen, methyl and trifluoromethyl,

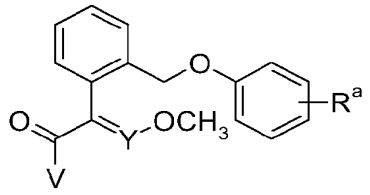
y is zero, 1 or 2,

R^b is as defined for formula I,

x is zero, 1, 2, 3 or 4

is used.

4. A method as claimed in claim 1, wherein an active ingredient of formula III



III

in which

T is a carbon or a nitrogen atom,

R^a represents one or two identical or different groups selected from halogen, C_1-C_6-alkyl, C_1-C_6-alkoxy, halogenmethyl, halogenmethoxy, methyl and trifluoromethyl, which R^a groups are unsunstituted or substituted by a C_1-C_6-alkoxyimino group;

V is OCH_3, or $NHCH_3$; and

Y is CH or N;

is used.

5. A method as claimed in claim 1, wherein compound I is selected from: pyraclostrobin, kresoxim-methyl, dimoxystrobin, 2-(ortho-((2,5-Dimethylphenyl-oxymethylene)phenyl)-3-methoxy-acrylic acid methyl ester, picoxystrobin, trifloxystrobin, enestroburin, orysastrobin, metominostrobin, azoxystrobin, and fluoxastrobin.

6. A method as claimed in claim 1, wherein compound I is selected from: pyraclostrobin, kresoxim-methyl, dimoxystrobin, 2-(ortho-((2,5-Dimethylphenyl-oxymethylene)phenyl)-3-methoxy-acrylic acid methyl ester, picoxystrobin, trifloxystrobin, enestroburin, orysastrobin, metominostrobin, azoxystrobin, and fluoxastrobin.

7. A method as claimed in claim 1, wherein compound I is selected from: azoxystrobin, pyraclostrobin, and picoxystrobin.

8. A method as claimed in any one of claims 1 to 7 wherein application is made during the first four weeks of the growth period of the plants or germination of the seeds.

9. A method as claimed in any one of claims 1 to 8, which is carried out as seed treatment.

10. A method as claimed in any one of claims 1 to 8 wherein repeated applications of a compound I are made.

11. A method as claimed in any one of claims 1 to 10 wherein repeated application of a compound I is made every 10 to 20 days.

12. A method as claimed in any one of claims 1 to 11 wherein two to ten applications of a compound I during a season are made.

13. A method as claimed in any one of claims 1 to 12 which is carried out as foliar application.

14. A method as claimed in any one of claims 1 to 13 applied to vegetables and field crops wherein application is carried out shortly after germination of the plants.

15. A method as claimed in claim 14 wherein application is carried out within the first four weeks after germination.

16. A method as claimed in any one of claims 1 to 15 applied to of fruit and vegetables which comprises more than two, and up to ten applications of a compound I.

17. A method as claimed in any one of claims 1 to 16 applied to of fruits and other perennial plants wherein the first application is made before begin of the growth period.

18. A method as claimed in claim 17 wherein the first application is made within the first four weeks of the growth period.